

Cryojet

This quick operating guide highlights certain procedures, detailed in the Cryojet™ manual, which, if followed, will ensure trouble-free operation of your Cryojet system. It is not intended to replace the Cryojet manual. Inexperienced operators should refer to the manual for detailed operating instructions and precautions.

Start-up if the system and dewar have completely warmed up

1. Remove both legs from the dewar.
2. Remove the top plate.
3. Empty and dry the dewar interior.
4. Inspect and clear the leg liquid entrance ports with a pointed object if necessary.
5. Re-install the legs.

(Depending on your use of the system, and your source of liquid nitrogen, you may find that you only need to carry out steps 1 to 5 periodically.)

6. Flow dry nitrogen gas through the nozzle for 90 minutes (if the dewar was free from moisture on inspection this may not be required).
7. Fill the dewar with liquid nitrogen.
8. Check all connections.
9. Turn the power on (check that the Auto-Start facility is on or off as appropriate (refer to the manual)).
10. If the Auto-Start facility is not being used, set the temperature to 100 K, the sample flow to 10 l/min, the shield flow to 4 l/min (or the usual operating values), and turn the automatic temperature control ON.
11. Observe that the temperature reaches the set point within around 60 minutes.

Operation

1. Adjust the temperature as desired and set the sample and shield flow rates to 6 l/min and 4 l/min (or the usual operating values).
2. Verify the absence of (frosty) cold spots except at the top of the dewar.
3. Confirm an adequate liquid nitrogen supply for unattended operation.

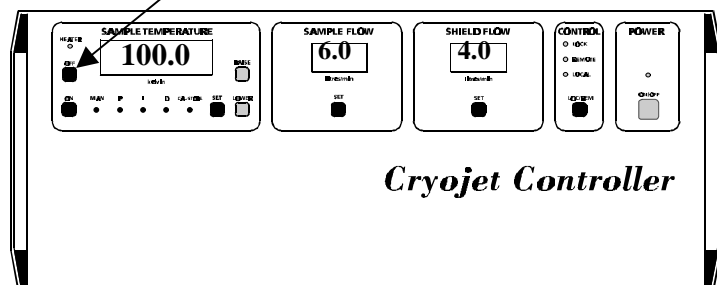
Shut Down

1. Set the temperature to 300 K and the flow rates to about 3 l/min until the displayed temperature reaches room temperature.
2. Turn the power off.
3. Insert a rubber stopper in the center tube of Cryojet nozzle.

In the event of a blockage

Following the above procedures should ensure that the Cryojet will not develop blockages. However, if a blockage of the coldhead does occur and the control heater is left on when this happens, there is a possibility that the heat exchanger could overheat.

Therefore if there is no flow of nitrogen gas through the nozzle, switch the heater off immediately using the OFF button on the left-hand side of the Cryojet controller.



Please then refer to the 'Fault Finding' section of the Cryojet Manual, which describes the actions necessary to unblock the system.

Evacuating the Outer Vacuum Chambers (OVC)

The OVC of both the sample flow unit and shield unit have to be pumped to high vacuum to ensure that they provide the required thermal insulation. Both are pumped in the factory, **but this needs to be repeated occasionally**. When the system is new, all of the materials inside the vacuum space are likely to outgas quickly, and this will affect the quality of the vacuum. This does not mean that the system is leaking.

Pumping with a two-stage rotary pump that has a base pressure of about 10^{-3} mbar is sufficient. A diffusion pump or turbo pump would also be suitable. Suitable pumps are available from Oxford Instruments Cryospares (+44 (0) 1865 393311).

The OVC of the sample flow unit should be pumped if either of the following symptoms appear:

- The sample flow unit feels cold to the touch, or condensation or frost appears. Some condensation or frost is normal on and just above the dewar top fitting.
- The jet does not reach the desired temperature, or the voltage supplied to the heat exchanger heater is lower than that given for the relevant temperature in the test results appended to this manual.

Please refer to section on 'Evacuating the Outer Vacuum Chamber (OVC)' of the Cryojet Manual for the correct procedure for evacuating the OVC and outgassing the sorb at the bottom of the dewar legs.

Do not bake the flexible transfer tube or coldhead as these contain plastic components.

Please then refer to the 'Fault Finding' section of the Cryojet Manual, which describes the actions necessary to unblock the system.

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Oxford Instruments Superconductivity

UK

Tubney Woods, Abingdon
Oxfordshire OX13 5QX
Tel: +44 (0) 1865 393 200
Fax: +44 (0) 1865 393 333

Germany

Otto-von Guericke Ring 10
D-65205 Wiesbaden
Tel: +49 6122 937 171
Fax: +49 6122 937 175

Italy

Via Irone Tolstoi 86
20098 San Giuliano
Milanese
Milan
Tel: (02) 982 531
Fax: (02) 982 41407

Japan

Haseman Building
2-11-6 Tomioka, Koto-ku
Tokyo 135-0047
Tel: 03 5245 3261
Fax: 03 5245 4472

Spain

Avda Mata Piñonera, 2
28700 San Sebastian de los Reyes
Madrid
Tel: +34 91 659 0740
Fax: +34 91 654 6794

U.S.A

130A Baker Ave. Ext.
Concord, MA 01742-2121
Tel: (978) 369-9933
Fax: (978) 369-6616

E-mail: superconductivity@oxinst.co.uk

www.oxford-instruments.com

